NGF DECREASES CANNABINOID RECEPTOR EXPRESSION IN MASSETER GANGLION NEURONS IN FEMALE RATS

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INTRODUCTION / AIM

In humans and rats, injection of nerve growth factor (NGF) into masseter muscles produces a prolonged local mechanical sensitization that mimics the symptoms of myofascial temporomandibular disorders and fibromyalgia, conditions that show greater prevalence in women than men. This study investigated whether NGF alters the expression of cannabinoid receptors (CB1 and CB2) and the transient receptor potential vanilloid 1 (TRPV1) receptor in the masseter ganglion neurons of female rats (n=5).

METHODS

Fast blue (10%, 10 μl) was injected bilaterally into the masseter muscles 7 days before termination to identify trigeminal ganglion neurons that innervate the masseter muscles. Rats also received injections of NGF (25 µg/ml, 10 μl) and vehicle (PBS) into the right and left masseter muscles, respectively, 3 days before termination. Trigeminal ganglia were removed and cut into 10 μm sections with a cryotome. Expression of CB1, CB2 and TRPV1 was investigated using commercially available antibodies and visualized with a confocal microscope. Expression in satellite glial cells (SGCs) was also investigated with an anti-glutamine synthetase antibody.

RESULTS

In saline injected muscle, 52±3% and 47±5% of masseter ganglion neurons expressed CB1 and CB2, respectively. NGF decreased expression of CB1 to 39±3% and CB2 to 33±6%, but no effect on TRPV1 expression was observed. Expression of CB1, but not CB2 was also found in SGCs.

DISCUSSION / CONCLUSIONS

These results suggest that NGF may induce local myofascial sensitization by reducing the inhibitory input from the peripheral cannabinoid system. Peripheral application of cannabinoids may counter this effect, providing analgesic relief.

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